Application No.: 09/994,573 Docket No.: 251002009400

PROPOSED CLAIM AMENDMENTS

1. (currently amended): A method for producing a soluble protein domain comprising:

(a) expressing at least two different nucleotide sequences each encoding a fusion protein comprised of a fragment of a starting protein and a protein exhibiting a function,

(b) selecting a fusion protein exhibiting said function from among the proteins synthesized in step (a), as comprising a fragment of said starting protein that is a soluble domain, and

(c) synthesizing the soluble domain included in the fusion protein selected in step (b) in a cell-free system.

2. (canceled)

3. (previously presented): The method of claim 1, wherein said protein exhibiting a function in step (a) is selected from the group consisting of an enzyme, a binding protein, a luminescent protein and a fluorescent protein, and functional portions thereof.

4. (previously presented): The method of claim 3, wherein said fluorescent protein is a green fluorescent protein or a variant thereof.

5. (currently amended): The method of claim 1, wherein said selecting in step (b) is performed in cells containing said nucleotide sequences by selecting a clone of said cells which exhibits said function.

6. (previously presented): The method of claim 5, wherein said cells are *Escherichia coli (E. coli)*.

7. (previously presented): The method of claim 1, wherein the fusion proteins are expressed in a cell-free system, and wherein said selecting in step (b) is performed by measuring the function of the fusion proteins.

8-9. (canceled)

10. (currently amended): A method for producing a soluble protein domain comprising:

(a) providing an expression vector which expresses a fusion protein of a first protein with a second protein that is a green fluorescent protein or a variant thereof,

(b) partially digesting said expression vector with DNA decomposing enzyme to obtain two or more DNA fragments of said vector containing deletions of the nucleotide sequence encoding the first protein,

(c) transforming *E. coli* with each of said DNA fragments prepared in step (b) to obtain two or more transformed *E. coli*,

(d) isolating a transformed clone that emits fluorescence among the transformed *E. coli* thus identifying a clone containing DNA that encodes a fusion protein with a soluble protein domain,

(e) recovering the DNA from the isolated transformed clone, and

(f) synthesizing the soluble protein domain encoded on the recovered DNA in a cell-free system.

11. (previously presented): A method for producing a soluble protein domain comprising:

(a) selecting a fusion protein that exhibits a function characteristic of a functional protein from a plurality of fusion proteins each composed of a first protein which is said functional protein and a second protein which is a candidate soluble domain, wherein in the selected protein said second protein is a soluble domain, and

(b) synthesizing a soluble domain that was included in the fusion protein selected from step (a).

12. (previously presented): The method of claim 11, wherein said second protein is encoded by a DNA fragment resulting from a partially digested DNA.

13. (previously presented): A method for producing a soluble protein domain comprising:

(a) providing an expression vector comprising a DNA encoding a fusion protein comprised of a first protein and a DNA coding for a second protein which is functional;

(b) treating said vector with a decomposing enzyme to form two or more digested vectors, each vector comprising a fragment of said DNA encoding the second protein;

(c) expressing fusion proteins encoded on the digested vectors obtained in step (b);

(d) selecting the fusion protein exhibiting the function characterizing the functional protein among two or more fusion proteins synthesized in step (c) as comprising a soluble domain of said first protein; and

(e) synthesizing the soluble domain included in the fusion protein selected in step (d) in a cell-free system.

14. (previously presented): The method of claim 13, wherein the selecting of step (d) is performed by transforming cells with the digested vectors, and selecting a clone which exhibits said function in the obtained transformants.

15. (currently amended): A method to synthesize a soluble domain that is a ~~portion~~ fragment of a starting protein which method comprises synthesizing, in a cell-free system, a protein identified as said soluble domain by:

(a) preparing a multiplicity of fusion proteins, each said fusion protein comprising a functional portion and a fragment of said starting protein,

(b) assessing each fusion protein for the function of the functional portion; and

(c) identifying, as a soluble domain, fragments of said protein which are contained in fusion proteins that exhibit the function of the functional portion.

16. (previously presented): The method of claim 15, wherein said preparing is performed in a cell-free system.

17. (previously presented): The method of claim 15, wherein said preparing is performed intracellularly.

18. (previously presented): The method of claim 17, wherein said preparing is performed *in vivo* in *E. coli*.

19. (previously presented): The method of claim 15, wherein the functional portion comprises an enzyme, a binding protein, a luminescent protein or a fluorescent protein or functional portions thereof.

20. (previously presented): The method of claim 19, wherein the fluorescent protein is green fluorescent protein or a variant thereof.

21. (currently amended): A method to produce a soluble domain that is a portion of a starting protein which method comprises

(a) expressing, in each of at least two *E. coli* colonies, a fusion protein comprising green fluorescent protein (GFP) or a variant thereof fused to a fragment of said starting protein and

(b) identifying a transformed *E. coli* colony that emits fluorescence, whereby a colony comprising a fusion protein containing a fragment that is a soluble domain is identified, and

(c) producing the soluble ~~protein~~ domain identified in step (b).

22. (previously presented): The method of claim 21, wherein each said fragment is obtained by a process comprising digesting nucleic acid encoding a fusion protein comprising said GFP or variant and said starting protein with a DNA digesting enzyme.

23. (previously presented): The method of claim 22, wherein said digesting is in only either from the 3′ or 5′ end of the nucleic acid.